

## Lunar All-Terrain Utility Vehicle for EVA, Phase I

Completed Technology Project (2007 - 2007)



## Project Introduction

ProtoInnovations, LLC proposes to develop a new type of planetary rover called a Lunar All-terrain Utility Vehicle ("Lunar ATV") to assist extra-vehicular activities in future lunar missions. The vehicle will operate unmanned or with an astronaut driving onboard. It will have a roughly 4 m<sup>2</sup> footprint and be able to about twice as fast as an astronaut can walk on the Moon. The vehicle will feature four-wheel, all-terrain mobility with traction control. A multi-purpose tool interface and interchangeable cargo bays will support a variety of mission payloads. The Lunar ATV will be used for mission such as site preparation, emplacing beacons, equipment and commodity distribution, and sampling. It will also be useful for human/robot interaction experiments taking place at NASA research centers. The primary innovations of this effort are: • A high-efficiency, long-life, lunar-relevant traction drive system • A simplified steer / suspension chassis built for speeds over 1 m/s without sacrificing weight or maneuverability • A multi-purpose tool interface for earthmoving, sampling, emplacing, etc. • Traction control software to maximize performance in earthmoving and negotiating rough terrain • CLARAty-compatible vehicle and tool interfaces to leverage NASA-developed teleoperation and autonomy software ProtoInnovations brings an impressive amount of experience to the task of designing the Lunar ATV. Working at Carnegie Mellon University, members of our team have developed robots to operate in some of the harshest environments on Earth: surveying Antarctic ice fields, traversing the Atacama Desert, exploring into an Alaskan volcano and mapping Chernobyl. In total, our robots have traveled roughly 500 km through some of the most difficult terrain on Earth. We've accomplished these tasks by building robots that are, above all else, controllable and reliable. Our team has experience building all of the subsystems involved in this project.



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## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Center / Facility:

Ames Research Center (ARC)

### Responsible Program:

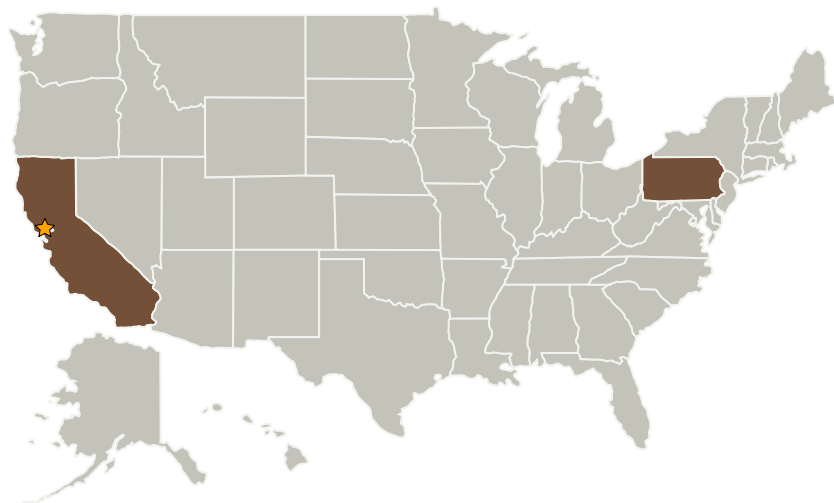
Small Business Innovation Research/Small Business Tech Transfer

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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Protoinnovations, LLC	Supporting Organization	Industry	Pittsburgh, Pennsylvania

## Primary U.S. Work Locations

California	Pennsylvania
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## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

## Technology Areas

**Primary:**

- TX07 Exploration Destination Systems
  - └ TX07.1 In-Situ Resource Utilization
    - └ TX07.1.1 Destination Reconnaissance and Resource Assessment